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P_2 for Rx = $
A New Waste Management Equation

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Excerpted with permission

In Appreciation

- THANK YOU to Catherine Zimmer and MNTAP

  Ms. Zimmer

  - Clinical experience as a medical technology scientist
  - Hazardous waste inspector in MN
  - Technical assistance for MN

MnTAP Overview

- Mission: assist MN business with pollution prevention, resource efficiency and cost savings.
- Grant funded through U of MN
- Non-regulatory
- Industry specialists
- Assistance types
  - Phone, site visit, presentations
  - Interns
  - Library, access to resources
  - Fact sheets, newsletter, website.

Pharmaceutical Waste Management

- Hospitals improve management
- 50,000 lbs disposed as hazardous/pharmaceutical waste in 2005
  - Disposal not previously reported
- Costs increase
  - Abbott NW
  - $30K to $300K/yr
- MN Pollution Control Agency
  - No pharmaceutical disposal to wastewater
  - March 2008

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Rx2: MnTAP Pharmaceutical Waste Reduction Projects

- 2006-2007
- Intern program

Projects' Purpose

- Minimize environmental pollution
- Minimize potential health effects
- Reduce reverse distribution and sample waste
- Improve Inventory Management
- Reduce Costs
  - Compliance
  - Waste Management

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Project Locations

- Large Hospital
  - Hennepin County Medical Center (HCMC)
  - ~500 beds + research & teaching
- Small Hospital
  - Tri County (TCH), Wadena MN
  - 25 bed Critical Access
- Clinic System
  - Cook Area Health Services
    - 5 clinics

Process Overview

- Reverse Distribution manifests
  - Top 10 drugs wasted
  - Crash box/cart and ambulances
- Sample and investigational drug waste

Findings Overview

- Crash boxes
- Reverse Distribution
- “Top Ten”
    - Epi intracardiac
    - Glutose gel
    - Nitrostat
    - Lidocaine bags
    - Other crash box drugs
    - Epi amps
    - Glucagon kit
    - Hydralazine
    - Multiple dosage types
- Inventory Management
    - Computerized/Omni Cells
- Samples
    - Policies/Logs
    - Vouchers/Top Ten
- Reverse Distribution Oversight
- Investigational Drugs

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Reverse Distribution Waste

- Costs
  - RD vendor, 9-30% of credit
  - Sorting costs
  - HCMC ~ 4%, $150,000
  - TCH ~ 9%, $60,500
  - Industry Average = 2%*
- Potential Savings
  - HCMC = $80,000
  - TCH = $47,000

*Handbook of Institutional Pharmacy Practice, ASHP, 2005.

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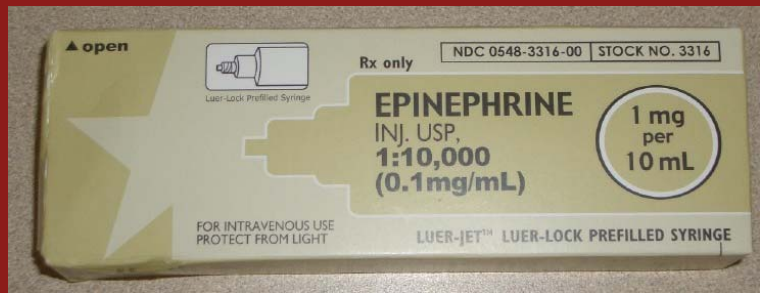
Crash Boxes/Carts

- Stock less crash boxes
  - Reduce number in pharmacy
    - 14 to 6
  - $3400 inventory reduction
  - One time labor savings of $250

Epinephrine Intracardiac Syringe

- Crash box and ER only
- 250 ordered; 4 used
  - 98% waste
- 13 lbs dual; 7.5 lbs hazardous
- Substitution with Epi Syringe
  - $1.70/syringe cheaper
  - $900 savings annually
  - Hazardous waste elimination



Glutose Gel 15 gm

- Only in crash box
- Cost of 1 Glutose 45=Cost of 3 Glutose 15
- Usual Dose 30 gm

- Substitution
  - Use only Glutose 15
  - Eliminates Glutose 45
  - Rotates through inventory faster
  - $340 annual savings
  - 15 lbs waste reduced

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Nitrostat/Nitroglycerin Tabs

- Omnicells and crash box (HCMC)
- 3% waste (110 waste/3300 purchase)
- Recommendation
  - Eliminate 100 count bottles, switch to generic 25 ct
  - $3.64/25 cheaper
  - Rotates through inventory faster
  - 3 months early
  - $2920 annual savings

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Lidocaine 2000mg/250 ml bags

- HCMC
  - Not routinely used
  - 98% waste
    - $200 and 32 lbs
- TCH
  - 83% wasted
- Recommendation
  - Minimize inventory based on par usage

Other Crash Box Drugs

- 17 other drugs
- Routinely used throughout hospital
- Recommendation
  - Return to pharmacy 3 months early
  - $4440 and 60 lbs (7 hazardous)
  - No added labor

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Epinephrine 1mg/ml -1ml amps

- Stocked almost everywhere
- HCMC: 14% waste (157/1100)

- TCH: 37% waste (40/109)
- Recommendation
  - Par Usage assessment
    - $50 but 157 P-listed hazardous ampules
    - TCH: 7 lbs P-listed waste
      - LQG status avoided
      - ~ $8000 training costs

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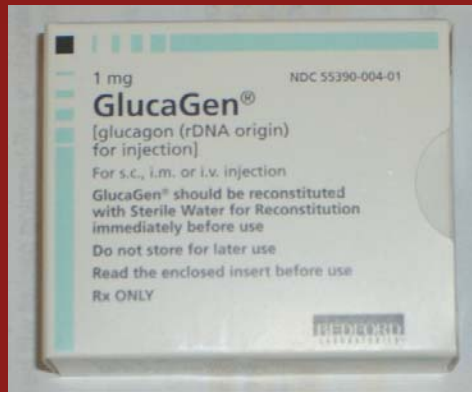
Glucagon Emergency Kit

- Emergency Medical Service (Ambulance) and Jail only (HCMC)
- 165 purchased; 30 wasted
  - 18% waste
- Substitution
  - $10.77/package cheaper
  - 61% package weight reduction
  - $3010 savings



Hydralazine 20mg/ml 1 ml vial

- Not stocked everywhere (large quantities some places)
- 2800 purchased; 183 wasted
  - 6% waste
- Recommendation
  - Par vs. Usage report
    - $1440 annual savings

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Multiple Dosage Types

- Multiple dosages
  - $6000 multiple dose returns/waste
- Recommendations
  - Standardization
  - Reduce stock
  - Potential reduction: 54 units
  - Medication: $1466
  - Disposal: $171
  - Storage
  - Total: $1637

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Omnicells (HCMC)

- Drug distribution stations
- Ability to track expiration dates
  - 3 month early expiration report
- Recommendation
  - Stock rotation
    - Expensive items
    - Not practical for every drug
  - Par-use reports(2%)
    - $66K/yr potential savings

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Purchasing/Inventory Management

Waste: 1786 full units

- Computerized system
  - Quadramed
    - Par use reports
    - Reorder list
    - Labeling hazardous materials
    - Price comparison
- Reduce waste 1385 units Savings
  - Costs:
    - Updating $416
    - System usage $7200
  - Net savings ~$38,000

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Inventory system cont…

- Total loss from waste: $60,500
  - Reduce from 9% to 2% waste
- Savings :
  - Reduce waste by 1385 units
  - Gross savings: $46,889
  - Costs: Updating $416
  - System usage $7200

Sample Waste

- HCMC
  - 210 lbs annually, $520 disposal
  - 25% dropped off expired within 2 months
  - Not all sources known or tracked
- Recommendations
  - Sample log
    - Purchasing
    - Implemented
  - Sample policy
    - 1 year dating

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Sample Waste

- Cook Area Health Services
  - 22 pounds/yr
  - $16,000 retail value/yr
    - $5.00/Pt
  - Disposal + training $6000/yr
    - $1.00/pt (0.2%)
- Recommendations
  - Retain Top Ten samples used
  - Voucher system for remainder

Self Sorting Waste

- TCH
  - self sorting by pharmacy staff
    - track waste
    - Costs avoided ~$2400 annually
- HCMC
  - Current process w/reverse distributor
  - Box/forms
  - 2.5% for on-site ($4100)
  - Awareness of what is being returned
    - Buy less
  - Waste management incentive
  - Find hazardous waste and in-dated items
  - $3230/yr net savings

Investigational Drug Waste

- 26 lbs
- Many sponsors won't take back drugs
- Recommendation
  - Investigational Drug Policy
    - Disposed of as hazardous waste
    - Small quantity generator - $25
    - Large quantity generator - $50

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Summary Savings & Reduction

- Potential
  - HCMC
    - $23,500-$89,500
    - 49 lbs of hazardous waste
      - 22,000 - 100 mg doses
    - 340 lbs of drug waste
      - 154,000 - 100 mg doses
  - TCH
    - $57,473
    - Avoid LQG
  - Cook Clinics
    - 22 pounds or ~10,000 - 100 mg doses
    - ~$3000 disposal costs
      - $1.00/ patient
    - $16,000 retail value
    - Avoid LQG
      - Training cost avoided ~$2300/yr

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Actual Savings & Reduction

- HCMC
  - Implemented
    - Omnicell/inventory
    - Reverse Distribution management (~$4K)
    - Total savings ~$80,000 annually
- TCH
  - Partial implementation inventory
    - $25K savings
    - Minimized multiple dosage types
  - Implemented
    - Self sorting waste $2.4K
    - Crash cart reduction $1.4
  - Total $30K savings
- Cook Clinics
  - Sample/Voucher combination
  - $6000 cost avoided
  - Retail value samples ~$20,000

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More Pharmaceutical P2*

- Improve health
  - Minimize drug use
- Encourage alternative therapies
- Minimize drug use in animal production
- Extend shelf life
- Ecotoxicology studies
- Improve dosing accuracy
- Patient dosing records

*Daughton, C., Cradle to Cradle Stewardship of Drugs Minimizing Environmental Disposition While Promoting Human Health, Env Hlth Persp: 111:5:775-785, 2003. www.epa.gov/nerlesd1/chemistry/ppcp/images/green2.pdf

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Resources

- MnTAP Pharmaceutical Web page
  - http://mntap.umn.edu/health/pharm.htm
- Catherine Zimmer
  - zimme052@umn.edu
- Practice Green Health (fna H2E) Blueprint
  - http://www.h2e-online.org/docs/h2epharmablueprint41506.pdf

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“Never doubt that a small group of thoughtful, committed citizens can change the world. Indeed, it’s the only thing that ever has”.

Margaret Mead